REMARKS

The application has been amended with a view to overcoming the formal objections to the description and also to the claims.

Concerning the Examiner's rejection of claims 7 and 8 under 35 USC § 112, the terms objected to by the Examiner have been eliminated or changed.

Reconsideration of the rejection under 35 USC § 112 is respectfully requested.

The Examiner has further rejected claim 1 under 35 USC 102(e) as being anticipated by Bartling.

He has furthermore rejected claims 1 and 2 under 35 USC 103(a) as being unpatentable over Sherlin in view of Fisher et al. and Eggerstadt.

The Examiner has also rejected claims 3 – 5 under 35 USC 103(a) as being unpatentable over Sherlin and Fisher et al. in view of Weber et al.

Furthermore, the Examiner has rejected claims 6 – 9 under 35 USC 103(a) as being unpatentable over Sherlin in view of EP 0 551 951 A1 and he has rejected claim 10 under 35 USC 103(a) as being unpatentable over Sherlin EP 0 551 951 A1 and Eggerstadt.

Claim 1 has been amended so as to include the subject matter of claims 3 and 4. The rejection under 35 USC 102(e) is therefore moot, but the rejection of claims 3 and 4 under 35 USC 103(a) as being unpatentable over Sherlin and Fisher et al. and in view of Weber et al. now applies to claim 1 as amended.

Sherlin (US 4 398 931) discloses a filter assembly for removing particulate matter from a high temperature gas stream which includes pipe-shaped filter elements arranged in a housing including a separation wall dividing the housing into a clean gas space and a raw gas space into which the filter elements extend from the clean gas space through the separation wall. Means are provided in the clean gas space for supplying backflushing gas to the clean gas space for backflushing the filter elements to thereby dislodge any dust collected on the filter elements. The backflushing gas is directed from the supply means directly into the filter elements.

Fisher et al. (US 3 653 188) discloses a dust collector including a housing having a plurality of filter bags mounted therein. Dirty gas flows into the inside of the bags and passes

therethrough to an exhaust conduit. Dust is deposited on the inside surface of the bags. For cleaning the bags are collapsed by a reverse flow of clean air so that the dust is dislodged and falls into a hopper at the bottom of the housing. The cleaning procedure extends over a certain period during which no dirty gas can flow into the housing, that is, normal dust collecting operation is shut down.

Weber et al. (US 5 106 395) discloses a process for avoiding formation of highly condensed aromatic hydrocarbons and dioxines in combustion systems such as waste incineration systems wherein dust is removed from the combustion exhaust gas of the incinerator by ceramic filters consisting of SiO_2 and/or Al_2O_3 and/or ZrO_2 and an inorganic binder. Momentary back-flushing for cleaning purposes is performed by introducing pressurized clean gas into the ceramic filters. For back-purging, a group of filter elements is de-coupled from the filtration process and at least one of those filters is subjected to a gas pressure pulse acting in a direction opposite to the direction of the flow of gas to be filtered. The cleaning gas is supplied through lines 14a, 14b to the interior of the filter tubes to detach the dust cake, which has been deposited on the outside surface of the filter tube. The lines 14a, 14b extend for that purpose into the filter tubes.

EP 0 551 951 A1 discloses a similar arrangement including secondary filters arranged at the exit of the filter cartridges 17. Back-flushing gas is supplied to the filter elements in the space between the filter elements and the secondary filters.

Eggerstadt (US 4,909,813) discloses a filter arrangement with a flow dynamic control element disposed on each filter element and having a passage for introducing back-flushing gas into the filter element and orifices with a relatively high flow resistance so that the high-velocity back-flushing gas flow is largely prevented from escaping through the orifices with high flow resistance during back-flushing but the relatively slow gas flow during filtering operation is essentially uninhibited.

The present invention as defined in amended claim 1 resides in a method for cleaning pipe-shaped filter elements arranged in a housing including a separation wall dividing the housing into a clean gas space and a raw gas space, into which the filter elements extend from the clean gas space through the separation wall. The raw gas space includes means for supplying raw gas thereto and the clean gas space includes an outlet for discharging clean gas

therefrom and also a backflushing inlet for momentarily supplying backflushing gas pulses to the clean gas space during filtering operation for backflushing the filter elements. A flow dynamic control element is disposed in the outlet to limit gas flow out of the clean gas space when backflushing gas pulses are supplied to the clean gas space. For cleaning the filter elements, backflushing gas pulses are supplied to the clean gas space through the backflushing inlet at a pressure which exceeds the raw gas pressure while the gas flow through the outlet is restricted by the dynamic flow control element for momentarily forcing the gas in the clean gas space back through the filter elements into the raw gas space thereby dislodging any dust collected on the filter elements. This is done during normal filter operation whereby the filter gas flow is momentarily stopped by the higher pressure flushing gas reverse flow.

The references cited by the Examiner disclose various backflushing techniques:

Generally, the filtering procedure is discontinued during backflushing or only individual filter elements are subjected to backflushing while the filtering flow through the other is maintained.

The references do not disclose that a backflushing gas pulse is supplied to a clean gas space to which all the filter elements are connected and which clean gas space has an outlet provided with a flow dynamic control element, which restricts the outlet when a higher pressure flushing gas pulse is supplied to the clean gas space. As a result, momentarily all the filter elements in communication with the clean gas space are subjected, at the same time, to a momentary cleaning action during which the normal gas flow through the filters is stopped by the higher pressure flushing gas pulse. Such a momentary stoppage can be accommodated by most systems with which such filters are used.

Such a method is certainly not described in, nor in any way obvious from, the referenced cited by the Examiner.

Reconsideration of claim 1 as amended is respectfully requested.

Claim 2 relates to a particular way of generating a backflushing pulses and claim 5 defines that the backflushing pulses consist mainly of clean hot gas.

These claims are dependent on claim 1 and should be considered to the patentable together with claim 1 as they include all the limitations of claim 1.

Reconsideration of claim 2 and 5 is also requested.

Claim 6 as amended defines an arrangement for clearing pipe-shaped filter elements arranged in a housing, with a separation wall dividing the housing into a raw gas space and a clean gas space between the separation wall and a cover of the housing. Tubular filter cartridges having closed ends are mounted in the separation wall so as to extend with their closed ends into the raw gas space, the open ends of the filter cartridges being disposed in the clean gas space. A safety filter element is engaged between the open end of each filter cartridge and the housing cover. Means for supplying raw gas to be cleaned are connected to the raw gas space and a clean gas outlet is connected to the clean gas space for discharging the cleaned gas. A flushing gas inlet is also connected to the clean gas space for supplying backflushing gas to the clean gas space. A flow-dynamic control element is disposed in the clean gas outlet which permits passage of cleaned gas out of the clean gas space but which essentially blocks passage when backflushing gas pulses under increased pressure are admitted to the clean gas space through the flushing gas inlet.

An arrangement as defined in claim 1 is not disclosed in the cited references:

None of the references discloses an arrangement wherein a clean gas space is provided which is in communication with all the filter cartridges and to which a flushing gas inlet is connected so that all the filter cartridges can at the same time be shortly subjected to a flushing gas pulse for a short period while the cleaning system flow is maintained, and none discloses that a flow dynamic control element is arranged in the clean gas outlet to block passage when a backflushing gas pulse is supplied to the clean gas space. Also, none of the arrangement discloses safety filter elements engaged between the filter cartridges in the clean gas space and the cover of the housing.

And since none of the references discloses such features, it can hardly be said credibly that a combination of the references would lead to the arrangement as defined in claim 6.

Reconsideration of the rejection of claim 6 under 35 USC 103 is therefore respectfully requested.

Claim 7 defines that a temperature resistant flap valve is disposed between the flushing gas control valve and the clean gas space to protect the flushing gas control valve from the excessive temperatures of the gas in the clean gas space. Such an arrangement is not disclosed in any of the cited references.

Claim 8 defines that the flow dynamic control element consists of a honeycomb body with passages having a cross-section capable of restricting gas flow therethrough during back flushing.

Claim 9 defines that the honeycomb body consists of a ceramic material and claim 10 defines selected materials for the ceramic honeycomb body.

These claims are considered to define novel features but, in any case, they are all dependent directly or indirectly on claim 6 and therefore include all the limitations of claim 6.

Reconsideration of these claims and allowance of claims 1, 2 and 5 to 10 is solicited.

Respectfully submitted,

K. Bach

Klaus J. Bach, Reg. No. 26832